

B1
cancel

aromatic compound with at least one hydroxyl group and the para position of which is free, with glyoxylic acid, said process being characterised in that the reaction is carried out in the presence of an effective quantity of a catalyst compound with at least two carboxylic functions.

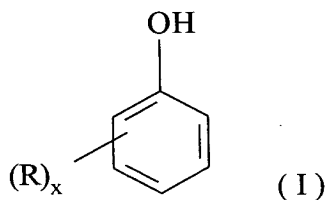
✓
Kindly replace the paragraph beginning at page 3, line 10, with the following:

B2

The aromatic nucleus has at least one hydroxyl group, but it can also have one or more other substituents. Generally, "several substituents" means less than four substituents per aromatic nucleus.

✓
Kindly replace the paragraph bridging pages 3 and 4 with the following:

Therefore, the process according to the invention is well suited for use with hydroxylated aromatic compounds corresponding to the following formula (I):



in which formula (I):

-the para position is free,

-x is an integer between 1 and 4,

-R represents:

- a hydrogen atom,
- a hydrocarbon group having from 1 to 20 carbon atoms selected from the alkyl, alkoxy, hydroxyalkyl, cycloalkyl, aryl, phenoxy, alkoxyalkyl, fluoroalkyl, hydroxyalkoxyalkylene groups,
- a hydroxyl group,
- a -CHO group,
- an acyl group having from 2 to 6 carbon atoms,
- a halogen atom, preferably a fluorine, chlorine or bromine atom,
- two R groups placed on two vicinal carbon atoms can form together with the carbon atoms to which they are attached, a benzene ring.
- B³
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✓
Kindly replace the paragraph beginning at page 4, line 10, with the following:

Examples of R radicals which can be attached to the aromatic nucleus are given hereinafter:

- alkyl radicals, such as methyl, ethyl, propyl, isopropyl, butyl, isobutyl, sec-butyl, tert-butyl, n-octyl, 2-ethyl hexyl, decyl, octadecyl, eicosyl,
- alkoxy radicals, such as methoxy, ethoxy, propoxy, isopropoxy, butoxy, isobutoxy, sec-butoxy, tert-butoxy, hexyloxy, decyloxy, hexadecyloxy, octadecyloxy, or a phenoxy radical,
- hydroxyalkyl radicals, such as hydroxymethyl, hydroxyethyl, hydroxypropyl, hydroxyhexyl, hydroxydecyl,
- cycloalkyl radicals, such as cyclopentyl, cyclohexyl, cycloheptyl,
- B⁴

- B⁴
concl'd
- fluoroalkyl radicals, such as fluoromethyl, diflyoromethyl, trifluoromethyl, fluoroethyl, 1,1,1-trifluoro ethyl, pentafluoroethyl, fluoropropyl, fluorobutyl, tribluoroamyl,
 - hydroxyalkyoxoalkylene radicals, such as hydroxymethyloxyethylene, hydroxyethyl di-(oxyethylene), hydroxyethyl tri-(oxyethylene), 1,2-hydroxyethyloxypropylene, hydroxyethyloxybutylene, hydroxypropyloxypropylene, hydroxybutyloxybutylene, hydroxybutyl di-(oxybutylene),
 - halogen atoms, such as fluorine, chlorine, bromine, or iodine.
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✓
Kindly replace the paragraph beginning at page 6, line 31, with the following:

B⁵
Of the list of afore-mentioned compounds, the aromatic compounds preferably used which have at least one hydroxyl group are: phenol, o-cresol, m-cresol, 3-ethyl phenol, 2-tert-butyl phenol, guaiacol, guetol.

✓
Kindly replace the paragraph beginning at page 7, line 10, with the following:

B⁶
The compounds with at least two carboxylic functions of general formula (II) in which R₁ represents a valency bond or a divalent radical preferably having 1 to 15 carbon atoms are quite particularly suitable for implementation of the process according to the invention.

✓
Kindly replace the paragraph beginning at page 7, line 14, with the following:

B7
The compounds with at least two carboxylic functions of general formula (II) in which R_1 represents a linear or branched, saturated or unsaturated aliphatic residue are particularly well suited for use of the process according to the invention.

✓
Kindly replace the paragraph beginning at page 8, line 6, with the following:

B8
The compounds with at least two carboxylic functions of general formula (II) in which R_1 represents a monocyclic or polycyclic hydrocarbon residue are also suitable for implementation of the process according to the invention.

✓
Kindly replace the paragraph bridging pages 8 and 9 with the following:

B9
The compounds having at least two carboxylic functions can correspond to general formula (II) in which the R_1 radical represents a polycyclic aromatic hydrocarbon divalent residue; the rings can form between themselves ortho condensed, ortho- and peri-condensed systems. More particularly, a naphthylenic residue can be mentioned; said rings being able to be substituted by 1 to 4 R_3 radicals, preferably by 1 to 3, R_3 having the meanings stated hereinabove for the substituents of the aromatic hydrocarbon residue of general formula (III).

✓
Kindly replace the paragraph beginning at page 9, line 4, with the following:

B¹⁰
In general formula (II) of the compounds with at least two carboxylic functions, R_1 can also represent a carbocyclic residue which is saturated or which comprises 1 or 2 unsaturations in the ring, generally having from 3 to 7 carbon atoms, preferably 6 carbon atoms in the ring; said ring being able to be substituted by 1 to 5, preferably 1 to 3, R_3 radicals, R_3 having the meanings stated hereinabove for the substituents of the aromatic hydrocarbon residue of general formula (III).

✓
Kindly replace the paragraph beginning at page 9, line 13, with the following:

B¹¹
The compounds with at least two carboxylic functions can also correspond to formula (II) in which R_1 represents a divalent radical constituted by a chain formation of two to four residues as defined hereinabove, an aliphatic residue, an aromatic residue, or a cycloaliphatic residue. These can be connected together by a valency bond or by a function group which can be, in particular, a group selected from the groups called Y.

✓
Kindly replace the paragraph bridging pages 9 and 10 with the following:

The following compounds with at least two carboxylic functions can be mentioned, quite particularly, by way of catalysts which are suitable for the present invention:

B¹²
- dicarboxylic aliphatic acids, such as:

- . oxalic acid
- . malonic acid
- . succinic acid

- . glutaric acid
- . adipic acid
- . 2,4-dimethyl adipic acid
- . pimelic acid
- . suberic acid
- . azelaic acid
- . sebacic acid
- . dodecane dioic acid
- . fumaric acid
- . maleic acid
- cycloalkanedicarboxylic acids, such as cyclohexane 1,4-dicarboxylic acid,
- aromatic dicarboxylic acids, such as:
 - . phthalic acid
 - . isophthalic acid
 - . terephthalic acid
 - . phenylenediacetic acid
 - . naphthalene 1,5-dicarboxylic acid
 - . naphthalene 1,6-dicarboxylic acid
 - . 4,4'-diphenylcarboxylic acid
 - . 3,3'-diphenylcarboxylic acid
 - . bis(4-hydroxycarbonyl) phenyl oxide
 - . bis(3-hydroxycarbonyl) phenyl oxide

12
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contd